REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
04-05-2009	FINAL	

4. TITLE AND SUBTITLE

Network Centric Warfare's Impact on Future Leader Development

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

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Paper Advisor (if Any): **Prof. Mark Seaman**

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Joint Military Operations Department
Naval War College
686 Cushing Road
Newport, RI 02841-1207

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

For Example: Distribution Statement A: Approved for public release; Distribution is unlimited.

13. SUPPLEMENTARY NOTES A paper submitted to the Naval War College faculty in partial satisfaction of the requirements of the Joint Military Operations Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.

14. ABSTRACT

Network Centric Warfare (NCW) plays a significant role in modern warfare. The benefits of information superiority and shared situational awareness across the battlefield cannot be disputed. However, analysis of the concept indicates potential for micromanagement comes with these advancing technologies. As a result, NCW has enabled the operational commander to imbue centralized execution at the tactical level of war, minimizing the need for junior commanders to rely on stated guidance and intent to accomplish the mission. Tactical commanders are therefore denied the ability to exercise judgment based on their experience and intuition, hindering development of their innovative and creative decision-making skills at lower command echelons. Continued growth of tomorrow's operational commander is crucial to the military's success. This paper will demonstrate that a lack of understanding of how to effectively incorporate NCW has a detrimental impact on the development of future leaders. Although present throughout all of the services at the operational level, micromanagement is most pronounced within the United States Navy. The paper concludes with recommendations for the operational commander to assist him in mitigating micromanagement and aiding in the leadership development of his subordinates.

15. SUBJECT TERMS

Operational Leadership, Micromanagement, Command and Control, Leadership Development

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Chairman, JMO Dept
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED		**26**	19b. TELEPHONE NUMBER *(include area code)* 401-841-3556

Standard Form 298 (Rev. 8-98)

NAVAL WAR COLLEGE
Newport, R.I.

NETWORK CENTRIC WARFARE'S IMPACT ON FUTURE LEADER DEVELOPMENT

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

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Signature: _____

04 May 2009

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Abstract

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INTRODUCTION

> *Everything starts and ends with leadership. Nothing else we accomplish, no other priority we pursue, is of much consequence if we do not have sound and effective leadership in place to enact it.*
>
> – Admiral Michael G. Mullen, *CNO Guidance for 2006*

Today, the operational commander is inundated with more technology and information than ever before. Network Centric Warfare (NCW)[1] affords the commander unprecedented access to a plethora of data, giving him increased situational awareness of the entire theater of operation. Such advances in the technological realm of warfighting advertise accelerated responsiveness and improved coordination in hopes of reducing the ever-present fog of war. However, if the operational commander is not careful, NCW offers a great opportunity for micromanagement.

Effective leadership is the most critical and dynamic element of combat power.[2] Over-relied on, NCW poses a challenge to today's operational commander in mastering the art of leadership. If he becomes too intimately involved in every decision, from strategic to tactical, he will ultimately suppress the initiative of his subordinate commanders. The result of such actions will be expectations of continued guidance from his subordinates, along with an associated reluctance to act without it. Consequently, the subordinate commanders' decision-making skills are weakened in the long run.

It is vital to keep in mind that warfare remains a human enterprise where "the human element is the most important element."[3] Continued growth of tomorrow's operational commander is crucial to the military's success. This paper will demonstrate that a lack of understanding of how to effectively incorporate NCW has a detrimental impact on the

development of future leaders. Although present throughout all of the services at the operational level, micromanagement is most pronounced within the United States Navy.

BACKGROUND

Operational Leadership

A leader is someone who inspires and influences people to accomplish organizational goals, whether it is by virtue of assumed role or assigned responsibility.[4] But what distinguishes an operational leader from a tactical leader? As Milan N. Vego indicates in his writings, a leader at the tactical level of command is limited to planning and fighting battles while a leader at the operational level of command focuses on the bigger picture by planning and conducting major operations or campaigns.[5] Leaders at the operational level use operational art to accomplish their objectives. Effective use of operational art requires a leader to possess operational competency in addition to solid leadership skills. "Operational competency requires mastery of the tactical domain and a deft understanding of the strategic."[6] In effect, commanders at the operational level of war generally have a broader scope in terms of time and space than do commanders operating at the tactical level.

Network Centric Warfare

At the core of NCW is a robustly networked force that provides information sharing to linked forces, therefore enhancing the quality of information and shared situational awareness through a common operating picture. NCW enables more collaboration and permits a flattened, decentralized command structure that promotes self-synchronization.[7] Decisions can then be made at the lowest possible level of command to meet the commander's intent, therefore enhancing sustainability and speed of command. All of these forces combined are intended to dramatically improve mission effectiveness.[8]

In the book, *Network Centric Warfare*, the authors explain that "[NCW] is about human and organizational behavior. NCW is based on adopting a new way of thinking–network-centric thinking–and applying it to military operations."[9] They proclaim that NCW is not just about technology; it is about the military's response to the Information Age.[10]

The Paradox

Operational leaders who have never forgotten the thrill of tactical prowess are mesmerized by the NCW promise of both the big-picture vision and pseudotactical connectivity.[11] The same NCW environment that is designed to widely distribute information to encourage decision-making at the lowest possible level also enables micromanagement by the commander at the operational level. Consequently, the desire for the commander to have his hand in the cookie jar ultimately creates additional lines of communication thus decreasing the speed of information flow. Not only does micromanagement undermine the intent of NCW by slowing down reaction times, it serves as a significant disservice to the leadership development of the junior officers because it fails to give them a chance to learn.[12]

Organizational Culture

In order to fully comprehend the paradox, it is important to have an understanding of the military's organizational culture. Unlike many organizations in the civilian sector where the leadership is often hired from external sources, the military grows its own leaders by promoting from within.[13] It is therefore up to the current leadership to help groom their subordinates to become the future leaders of the organization.

With such an incestuous culture, how then can the military have flaws at the operational level? To understand how this is possible it is important to realize how one

develops leadership skills to the point where they are effective at the operational level of command. In order to move through the ranks at the lower levels of command one must demonstrate tactical prowess to prove worthy of promotion. It is this same tactical proficiency as a warfighter that also affords one the opportunity to reach command at the operational level. Once there, the commander is expected to suppress his tactical leadership mindset that has paved the way for his success and focus his energy on the operational realm of leadership. Not every leader is successful in this transition.

DISCUSSION

Gone are the days when once a ship left homeport the commander was fully reliant on his subordinate commanders to accomplish the mission. The advent of NCW has resulted in a trend of centralized control of execution among senior leaders, having effectively disregarded the lines between strategic, operational, and tactical levels of war. There is an enormous temptation for upper echelon commanders to reach forward and directly impact decision-making at lower levels. "At the operational level, the ability to exercise a more centralized style of control combined with the apparent necessity to dictate tactical execution will tend to mitigate the necessity for an operational leader to create [and enforce] a clear and concise commander's intent."[14]

According to joint doctrine, commander's intent "provides focus to the staff and helps subordinates and supporting commanders take actions to achieve the military end state without further orders, even when operations do not unfold as planned."[15] In the U.S. Navy, Navy Warfare Publication 3-32 discusses commander's intent in detail. It clearly states that the Navy operational commander should rely on the initiative of his subordinate commanders to act in a manner that satisfies his stated intent while ensuring coordination with other

elements of the force.[16] However, despite the emphasis placed on "intent" in publications, the Navy fails to culturally implement it in their day-to-day operations. If the commander's intent is clear and concise, there should be no need for further amplification on a daily basis. Nonetheless, to this day, naval commands such as Carrier Strike Group THREE still rely on their Daily Intentions Message (DIMS) to relay information to both their seniors and subordinates.[17] NCW, which allows unprecedented access to a plethora of real-time information, is affording the operational commander the ability to create and disseminate these critical guidelines on the fly, breeding an environment of centralized control. Unfortunately, such actions allow the commander to fall victim to several age-old deficiencies of command including potential information overload, second-guessing, micro-management, stifling of initiative, and distractions.[18]

In addition to advances in technology internal to the military, outside technological influences such as the media also contribute to centralized control. Media warfare can put an enormous time constraint on decision makers.[19] These external forces compel the military to alter how they process information. Often, operational commanders are forced to bypass lower echelons of leadership when dealing with time-sensitive material and the media, requiring them to back brief their commanders only after the information has been displayed over the public airwaves.

It is important to note that one of the U.S. military's greatest strengths is the initiative of its tactical commanders. However, if junior officers become accustomed to centralized control from operational leadership where decisions are made exclusively from senior leaders, there is a great likelihood that they will grow hesitant and indecisive. The temptation on the part of senior leaders to meddle in lower level decisions creates a danger of

taking initiative and independence away from individuals at lower echelon levels. Additionally, it shows a lack of trust in their abilities. Over time, relying on centralized execution becomes a crutch, stifling the junior officer's leadership development.

Experience plays an integral role in fostering long-term professional growth, and it is clear that development of certain skills is hindered when the experiences exist in an environment of micromanagement. In the U.S. Navy specifically, a zero-defect mentality is a major contributor to such an environment. Mistakes on the job are rarely used as training tools, rather addressed immediately and publicly with punitive corrective actions. A perfect example is assist visits, which have evolved into practice inspections that require the same degree of preparation as the inspection itself. Therefore there is no room for mistakes.[20] In effect, with someone always looking over their shoulder, micromanagement eliminates the need for those junior officers to develop the skills of decision-making, intelligent risk taking, creativity, and innovation.

Additionally, being able to learn from ones own experience is an essential competency for coping with increasing complexity and change. To then have the ability to adapt to such an environment requires cognitive skills.[21] "Cognitive skills are any mental skills that are used in the process of acquiring knowledge; these skills include reasoning, perception, and intuition."[22] Yet, coupled with micromanagement, the dramatic increase in situational awareness provided by NCW reduces cognitive loading. A comment made by a Captain from the 7th Cavalry Regiment reaffirms the decreased reliance on cognitive skills on today's battlefield: "Sitting on top of a moving turret, talking into the radio, trying to control the vehicle, getting a red flashlight, finding the map, looking at the map, figuring out where I am with the PLGR (GPS), back to the map . . . with FBCB2 I didn't have to do any of that to

know where I was."[23] The operator's ability to make use of the information provided by the network, combined with the centralized direction received from upper echelon commanders, eliminates the need to develop the cognitive piece of the leadership skill set. Therefore, as these junior officers progress in their careers the military will be full of senior leaders who have significantly diminished capability for operational command.[24]

The importance of cognitive abilities in modern warfare cannot be ignored. As Milan Vego explains, the military (particularly the U.S. Navy) has placed boundless faith in the value and importance of new technologies, grossly neglecting the human element of warfare. It is the human element of logic and common sense that serves as the key for making sound operational decisions. These decisions require the ability to synthesize both the strategic and tactical information in order to have an accurate picture of the operational situation.[25] Technological advances in intelligence gathering and information sharing are merely tools that contribute to successful combat operations. There is no substitute for sound decision-making and skillful leadership. Ultimately, the human factor will prove most crucial to victory.

One could argue that if the operational commander possesses both the tactical data and the cognitive skills necessary to make effective strategic, operational, and tactical decisions better and faster, then maybe he should. However, there are drawbacks to this argument. Such a statement assumes the commander will always have unimpeded access to information and that there will always be a continuity of operations. NCW plays a significant role in the acquisition and timely dissemination of vital intelligence to the operational commander. Nevertheless, when the commander becomes tied to technology, it becomes a capability that is vulnerable.

It is therefore imperative that in the event of technological failure the operational commander trusts his subordinates to continue on with the mission. Yet, it must not be forgotten that objectives are achieved by the application of sound operational art. Success on the battlefield requires the ability to quickly analyze a situation and come up with innovative solutions. "The speed at which events will occur and their complexity will require leaders with agile minds who can think through a problem logically, come up with viable courses of action, and translate that concept into clear, simple language to his subordinates."[26] If subordinate commanders are bred in an environment dominated by micromanagement, they may have never developed the required skills to master operational art. Too often, NCW is relied upon as a method of warfare, when in actually it is merely an enabler. If individuals are not afforded the opportunity to have hands on experience in how to effectively incorporate NCW in combat situations, they cannot be expected to successfully do so when no one is looking over their shoulder.

Counterargument

NCW has tremendous capabilities. Appropriate application of NCW tools and procedures yields improved flexibility and planning that not only enhances mission accomplishment, but also fosters the development of the subordinate commander. A case study examining U.S. Fifth Fleet's Commander Task Force Fifty (CTF-50), embarked on the nuclear aircraft carrier USS Carl Vinson (CVN 70), reveals NCW can be a viable tool to promote long-term professional development. As one of the first studies of a staff at the operational level of war, it paid considerable attention to the given conditions and climate that made CTF-50's implementation of NCW tools successful.[27]

Rear Admiral (RADM) Thomas Zelibor, Commander CTF-50, was willing to give up some personal control in order to realize the benefits of NCW. He entrusted his staff with the operational leeway to execute his intent through utilization of the tools afforded by NCW. Of these tools, the most notable was the staff's success at implementing the Knowledge Web (KWeb) into their day-to-day operations.[28] Because the Admiral insisted on making the KWeb his primary means for gaining situational awareness the staff religiously updated their sites, therefore facilitating information flow. Consequently, with all the current information available to the commander on the KWeb, there was no need to spend extra time and effort on the time-honored Navy tradition of building PowerPoint presentations. Routine daily briefs could be conducted straight from the web pages. As a result, staff members had time to have "what if" discussions and were able spend more time conducting tactical and strategic planning. By appropriately incorporating NCW into his staff's daily routine, RADM Zelibor was able to effectively push his vision downstream, thus fostering the professional development of the staff members at the lower levels of his command.

CONCLUSIONS

RADM Zelibor was a unique flag officer. He was able to cultivate a command climate of trust and understanding that is the foundation for NCW success. As the case study shows, if implemented correctly, NCW can have a positive impact on the professional development of junior leaders. However, most commanders do not possess the command style that allows this level of decentralized decision-making. Most strike group commanders, to date, have failed to be as effective at networking their forces.[29]

NCW plays a significant role in modern warfare. The benefits of information superiority and shared situational awareness across the battlefield cannot be disputed. While

technology does act as a force multiplier, it must not be forgotten that leadership is what allows us to leverage that technology. Nonetheless, as demonstrated, the potential for micromanagement comes hand in hand with these advancing technologies. NCW has enabled the operational commander to imbue centralized execution at the tactical level of war, minimizing the need for junior commanders to rely on stated guidance and intent to accomplish the mission. Tactical commanders are therefore denied the ability to exercise judgment based on their experience and intuition, hindering development of their innovative and creative decision-making skills at lower command echelons. As a result, the effectiveness of tomorrow's operational leader is in jeopardy.

The military must challenge the leaders of today to develop the operational leaders for tomorrow. The key for the commander will be to find the right balance between leadership and management. Many of the services have effective development plans in place to accomplish such a task; however, the U.S. Navy is lagging behind in this endeavor. Long-term leadership growth needs to focus on development of subordinates who are no longer dependent on their leaders for decisions, and who can operate on intent without fear of reprisal. The following are recommendations for the operational level commander to assist him in mitigating micromanagement and aiding in the leadership development of his subordinates.

RECOMMENDATIONS

Commander's Intent

To begin with, operational leaders must establish a clear commander's intent and ensure that it is effectively distributed and understood down the chain of command. A clear commander's intent provides necessary vision and enables subordinate commanders to

clearly understand what actions must be taken to accomplish the commander's overall objective. It should give free rein to the initiative of the subordinate commanders when the original plan no longer applies, therefore enabling the lowest echelon leaders to make the right decisions in time critical situations.[30]

It is imperative that operational commanders inculcate their intent from day one via their Operation Order. This will prevent them from falling victim to the temptation to use NCW capabilities to relay their intent as the situation unfolds. Similarly, the theater Rules of Engagement and Special Instructions (SPINS) must be founded in the commander's intent and enable the tactical commander to act. Failure to allow the tactical commander to act without the operational commander's permission ultimately stifles his development.

A clear commander's intent therefore fosters a more decentralized control structure, which is the ultimate aim of NCW. When the commander is able to separate himself from the tactical aspect of warfare, he is then able to focus on the larger operational picture. A reduction in "over-the-shoulder" leadership on behalf of the operational commander stimulates--as opposed to micromanagement that stifles--the development of initiative and innovation among subordinate commanders.

Culture Shift in Training and Exercises

These stipulations are not merely a requirement during wartime. The stage for leadership development needs to be set prior to stepping foot in the theater of operations. It begins during training and exercises. For starters, it should be imperative that the operational commander participates in the training. Too often leaders at the operational level have the mindset that "training" is merely for their staffs, for example those personnel who have less

experience than they do. The demands placed on today's operational leader often dissuade them from being intimately involved in training during peacetime.

It is crucial for the commander to have the opportunity to view the performance of his subordinates for two reasons. First and foremost, it allows him to build trust in his subordinates' abilities. In order to work together successfully in a NCW bred self-synchronization environment, a high level of trust must be maintained across all levels of leadership. "At a minimum, this means that they have exercised together successfully across the wide range of missions involved."[31] Operational leaders who have had the opportunity to observe their subordinates' decision making skills under various circumstances are able to build trust and confidence in their tactical execution. As a result, the operational commanders will be less likely to micromanage the situation under the assumption they could perform the task more effectively themselves.

Second, and as equally important, it allows for mentoring and feedback on behalf of the operational commander. Training our own replacement needs to become a larger emphasis of the Navy's culture. Mentoring must be at the heart of any serious leader development program. It requires one-on-one, face-to-face counseling in order to help prepare junior leaders for increased responsibility by helping to further their professional development.[32] This is accomplished through feedback as to whether or not appropriate decisions were made. The key to effective feedback is that it must be timely, relevant, and informative.[33] Both mentoring and associated feedback are not possible if the operational commander is not a viable participant during both training and exercises.

While feedback is critical, so too is an environment which tolerates well-intentioned mistakes.[34] The operational commander must cleanse his environment of the zero-defect

mentality that too often drives naval operations, especially during times of training. When subordinate commanders make "wrong" decisions, they should not be seen as failures, but rather opportunities from which to learn. Under this mindset, junior leaders are much more likely to be engaged. Engaged people innovate. It is critical to development to allow people to experiment without fear of retribution if they fail. They will then be able to leverage their own experiences and be of more value to the organization in the future.

Development of the Cognitive Domain

As previously discussed, well-developed cognitive skills are a critical factor in the effectiveness of an operational commander. It is therefore crucial for the future leader to have exposure to cognitive thinking earlier, rather than later, in his career. In the U.S. Navy in particular, we wait too long to groom our future leaders. There needs to be a much greater focus on thinking and cognitive skill development in lower level schooling. Operational and strategic level leadership courses such as the Joint Force Maritime Component Course for Flag Officers occur too late in an officer's career. By the time a commander reaches the Flag/General Officer level, he should carry with him a fully developed cognitive skill set.

So how do we get there? To begin with, the Navy needs to shed themselves of the time-is-money mentality where the main goal of the education initiative is to get individuals back to their assignments quickly. This is anchored solidly in a fundamental cultural bias toward "on-the-job-training." It is unacceptable that seats at sister Service Professional Military Education schools go unfilled because the Navy is unwilling to pull credible officers from their operational line communities.[35]

Although not specifically required for certification, service colleges are expected to provide leadership education to their students. "Ironically, however, the service institutions

do not focus on leadership education."[36] The Navy, specifically, has no curriculum designed to educate and develop leaders to bring strategic thinking skills and innovative approaches to the challenges of transforming organizations. The Navy's PME, as well as the syllabus at the Naval War College, offer no core courses in leadership education. "Each of the College's three core courses claims to provide leadership education as an integral part of its curriculum, but learning modules and objectives directed to that end are conspicuously absent."[37] A true leadership syllabus needs to be added to the curriculum so that education is available to all students and not just those who are enrolled in the "Leadership Area of Study" as their elective choice.

Leadership at the operational level of command requires leaders to be well educated in the concept of battle command. Battle command refers to the art of battle decision-making, and is centered on the commander's mental qualities and cognitive abilities.[38] "Although information technology will greatly enhance military operations, it will not alter the battle command process; therefore, mastering the art of battle command is still paramount to the commander's successful decision making, creation of information superiority, and decisive military operations."[39] It is ultimately the commander's ability, experience, and wisdom that will allow him to convert the information provided through NCW to operational and strategic knowledge.

Equally important is the operational commander's understanding of the future uses and limits of information technology and its effects on battle command.[40] It is crucial that the commander learn how a decision can be enhanced with technology vice driven by it. Doctrine development on employment of technology is a necessary next step to properly incorporating NCW with operational leadership. It is important to set guidelines for how to

property utilize NCW as a tool in order to help deter the desire to exploit that information for the purposes of micromanagement. Education, combined with doctrine, must emphasize the proper functions and applications of available technology as it relates to the respective levels of warfighting.

In his book, "Understanding Information Age Warfare," David Alberts contends that an individual's direct experience with the physical domain contributes to the development of the cognitive skills.[41] It is important to recognize that the changing skills and values needed by leaders cannot be acquired solely from attending formal training. Therefore, it is essential to capitalize on developmental opportunities afforded during operational assignments. The extent of development is dependant upon the types of challenges offered by these assignments. More learning occurs when individuals are able to analyze their experiences and learn from them.[42] It is apparent that proper development of cognitive skills does not occur when the experiences exist in an environment of micromanagement that fosters a restricted learning atmosphere.

The Army has already adopted such a shift in perspective, viewing people as active players who pursue their own development vice passive receivers of whatever training is bestowed upon them. The Navy's leadership development could greatly benefit by shifting to a mindset where individuals are proactive in developing relationships with mentors. Those mentors and advisors need to help identify assignments that provide an opportunity to develop the cognitive skills needed to lead the Navy into the future.[43]

In summary, we must be able to find an effective balance where technology furthers, rather than hinders, development of the future leader. My recommendations help shape that balance. If we are successful in developing great leaders for our future, we will be rewarded

with individuals who are unafraid to share information and unleash the initiative of their subordinates.

NOTES

[1] For the purpose of this paper, NCW is defined as "an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization." David S. Alberts, John J. Garstka, and Frederick P. Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority*, *2nd Ed.* (Washington, DC: DoD C4ISR Cooperative Research Program, 1999), 2.

[2] U.S. Army, *Operations*, Field Manual (FM) 3-0 (Washington, DC: Headquarters Department of the Army, 27 February 2008), 4-6.

[3] Milan N. Vego, "Future War At Sea: Decline of Human Decision-Making in Naval Operations," (*Naval Forces*, January 2009), 8.

[4] U.S. Army, *Army Leadership: Competent, Confident, and Agile*, Field Manual (FM) 6-22 (22-100) (Washington, DC: Headquarters Department of the Army, 12 October 2006), 1-1.

[5] Milan N. Vego, *Joint Operational Warfare: Theory and Practice*, (Newport, RI: U.S. Naval War College, 2007), X-5.

[6] Christopher D. Hayes,"Developing the Navy's Operational Leaders: A Critical Look," *Naval War College Review*, Washington: Summer 2008, Vol.61, Iss.3 http://proquest.umi.com (accessed 24 March 2009).

[7] VADM Cebrowski defines self-synchronization as follows: Self-synchronization is the ability of a well-informed force to organize and synchronize warfare activities from the bottom up. The organizing principles are unity of effort, clearly articulated commander's intent, and carefully crafted rules of engagement. It overcomes the loss of combat power inherent in top-down command directed synchronization characteristics of more conventional doctrine and converts combat from a step function to a high-speed continuum. VADM Arthur K. Cebrowski and John J. Garstka, "Network-Centric Warfare: Its Origins and Future," *U.S. Naval Institute Proceedings*, 124 No.1, January 1998. http://www.usni.org/Proceedings/Articles98/PROcebrowski.htm (accessed 25 March 2009).

[8] Office of Force Transformation, Department of Defense, *The Implementation of Network Centric Warfare*, January 5, 2005.
http://www.au.af.mil/au/awc/awcgate/transformation/oft_implementation_ncw.pdf (accessesd 30 March 2009).

[9] Alberts, Garstka and Stein, *Network Centric Warfare*, 88.

[10] Ibid., 88.

[11] John P. Springett, II, "Network Centric War Without Art," *U.S. Naval Institute Proceedings*, Annapolis: Feb 2004, Vol. 130, Iss. 2 http://proquest.umi.com (accessed 24 March 2009).

[12] Jennifer Free, "Network-Centric Leadership: Why Trust is Essential," *U.S. Naval Institute Proceedings*, Annapolis: June 2005, Vol. 131, Iss. 6 http://proquest.umi.com (accessed 24 March 2009).

[13] During a Distinguished Visitor event on board the USS JOHN C. STENNIS in June 2008, a group of senior executives from the civilian sector had a chance to sit down with the Strike Group Commander and discuss leadership within the Navy. They were in awe of the teamwork they had witnessed on board, and inquired as to why the Admiral believed the organization was such a fine-tuned machine. His answer referred to the process of promoting from within, with senior leaders grooming their subordinates to be the leadership of the future.

[14] Springett, *Network Centric War Without Art*.

[15] Chairman, U.S. Joint Chiefs of Staff. *Doctrine for Joint Operations*, Joint Publication (JP) 5-0 (Washington, DC: CJCS, 26 December 2006), 3-24.

[16] U.S. Navy, *Maritime Operations at the Operational Level of War*, Navy Warfare Publication (NWP) 3-32, (Washington, DC: Department of the Navy, Office of the Chief of Naval Operations, 18 October 2008), 2-2.

[17] Information based off previous experience with CSG-3, as well as updated verification with current CSG-3 members.

[18] David S. Alberts, *The Unintended Consequences of Information Age Technologies*, (Washington, DC: National Defense University, 1996), 6.

[19] Richard E. Hayes and Gary Wheatly, *"Information and Deterrence,"* Strategic Forum, Number 87, October 1996. http://ics.leeds.ac.uk/papers/vp01.cfm?outfit=pmt&folder=66&paper=774 (accessed 03 April 2009).

[20] John T. Natter, Alan Lopez, and Doyle K. Hodges. "Listen to the JO's: Why Retention is a Problem." *U.S. Naval Institute Proceedings*. Annapolis: Oct 1998. Vol. 124, Iss. 10. http://proquest.umi.com (accessed 24 March 2009).

[21] James G. Hunt, George E. Dodge, and Leonard Wong, eds. "Out-of-the-Box Leadership: Transforming the 21st Century Army and Other Top-Performing Organizations." *Monographs in Leadership and Management, Vol.1* (JAI, 2007), 264.

[22] North Central Regional Educational Laboratory, "Cognitive Skills," Learning Point Associates. http://www.ncrel.org/sdrs/areas/issues/content/cntareas/reading/li1lk23.htm (accessed 05 April 2009).

[23] Garstka, John J., *"An Introduction to Network Centric Operation,"* Presentation to NCO Short Course, 13 July 2004, Office of Force Transformation, http://74.125.47.132/search?q=cache:http://www.au.af.mil/au/awc/awcgate/transformation/oft_intro_nco_jul04.pdf (accessed 25 March 2009). ******Force XXI Battlefield Command Brigade and Below (FBCB2) is a communication platform designed for commanders to track friendly forces on the battlefield. It increases a vehicle commander's situational awareness of the battlefield by gathering information graphically instead of collecting reports verbally.

[24] Springett, *Network Centric War Without Art*.

[25] Vego, *Future War At Sea*, 10.

[26] Hunt, *Out-of-the-box Leadership*, 292.

[27] Mark Adkins and John Kruse, *Case Study: Network Centric Warfare in the U.S. Navy's Fifth Fleet* (University of Arizona: Center for the Management of Information, 3 August 2003), 2.

[28] "The knowledge web (KWeb) is a web-based information system originally developed by Space and Naval Warfare Systems Center SSC . . . The initial concept was to display "lots" of information to various members of the staff." Adkins and Kruse, *Fifth Fleet Case Study*, 15.

[29] Ibid., 15. ** Additionally, authors personal experience in CSG-3.

[30] Vego, *Joint Operational Warfare*, IX-30.

[31] David S. Alberts and Richard E. Hayes, *Power to the Edge: Command and Control in the Information Age* (CCRP, 2003), 32.

[32] Hunt, *Out-of-the-box Leadership,* 291.

[33] David Potts, ed. *The Big Issue: Command and Combat in the Information Age (*CCRP, 2003, Number 45), 105.

[34] Ibid., 105.

[35] Christopher D. Hayes, *Developing the Navy's Operational Leaders*.

[36] Ibid. **The only Process of Accreditation of Joint Education-certified institution with leadership education as a core element of its curriculum is the Industrial College of the Armed Forces (ICAF).

[37] Ibid.

[38] Major Demetrios J. Nicholson (U.S. Army), "Seeing the Other Side of the Hill: The Art of Battle Command, Decision-making, Uncertainty, and the Information Superiority Complex," *Military Review*, Fort Leavenworth, KS: November/December 2005, 58.

[39] Ibid., 57.

[40] Ibid., 63-64.

[41] David S. Alberts, John J. Garstka, Richard E. Hayes, and David A. Signori. *Understanding Information Age Warfare* (CCRP, 2001), 18.

[42] Hunt, *Out-of-the-box Leadership,* 268.

[43] Ibid., 268.

BIBLIOGRAPHY

Adams, Thomas K. "Future Warfare and the Decline of Human Decisionmaking." *Parameters*. Carlisle, PA: US Army War College Quarterly. Winter 2001-02, 57-71.

Adkins, Mark and John Kruse. *Case Study: Network Centric Warfare in the U.S. Navy's Fifth Fleet.* University of Arizona: Center for the Management of Information, 3 August 2003.

Alberts, David S. *The Unintended Consequences of Information Age Technologies.* Washington, DC: National Defense University, 1996.

Alberts, David S., John J. Garstka, Richard E. Hayes, and David A. Signori. *Understanding Information Age Warfare*. CCRP, 2001.

Alberts, David S., John J. Garstka, and Frederick P. Stein. *Network Centric Warfare: Developing and Leveraging Information Superiority*. *2nd Ed*. Washington, DC: DoD C4ISR Cooperative Research Program, 1999.

Alberts, David S. and Richard E. Hayes. *Power to the Edge: Command and Control in the Information Age.* CCRP, 2003.

Anderson, T.D. *Transforming Leadership: Equipping Yourself and Coaching Others to Build the Leadership Organization*, 2nd ed. Boca Raton, FL: St. Lucie Press, 1998.

Barnett, Thomas P.M. "The Seven Deadly Sins of Network-Centric Warfare." *U.S. Naval Institute Proceedings*. Annapolis: January 1999. Vol. 125, 36-39. http://proquest.umi.com (accessed 24 March 2009).

Cebrowski, VADM Arthur K. and John J. Garstka. "Network-Centric Warfare: Its Origins and Future." *U.S. Naval Institute Proceedings*. 124 No.1, January 1998. http://www.usni.org/Proceedings/Articles98/PROcebrowski.htm (accessed 25 March 2009).

Clark, General Wesley K. *Waging Modern War*. New York, NY: Public Affairs, 2001.

Crump, Paul A. "At Risk, the Effectiveness of Tomorrow's Operational and Strategic Leaders." Unpublished Research Paper, U.S. Naval War College, Newport, RI: 2006.

Free, Jennifer. "Network-Centric Leadership: Why Trust is Essential." *U.S. Naval Institute Proceedings*. Annapolis: June 2005. Vol. 131, Iss. 6, 58-60. http://proquest.umi.com (accessed 24 March 2009).

Friedman, Thomas L. *The World is Flat*. New York: Farrar, Straus and Giroux, 2005.

Garstka, John J. *"An Introduction to Network Centric Operations."* Presentation to NCO Short Course, 13 July 2004. Office of Force Transformation. http://74.125.47.132/search?q=cache:http://www.au.af.mil/au/awc/awcgate/transformation/oft_intro_nco_jul04.pdf (accessed 25 March 2009).

Hayes, Christopher D. "Developing the Navy's Operational Leaders: A Critical Look." *Naval War College Review*. Washington: Summer 2008. Vol.61, Iss.3, 77-109. http://proquest.umi.com (accessed 24 March 2009).

Hayes, Richard E. and Gary Wheatly. *"Information and Deterrence."* Strategic Forum. Number 87, October 1996. http://ics.leeds.ac.uk/papers/vp01.cfm?outfit=pmt&folder=66&paper=774 (accessed 03 April 2009).

Hooijberg, Robert, James G. Hunt, John Antonakis, Kimberly B. Boal, and Nancy Lane, eds. "Being There Even When You Are Not: Leading Through Strategy, Structures, and Systems." *Monographs in Leadership and Management, Vol. 4*. JAI, 2007.

Hunt, James G., George E. Dodge, and Leonard Wong, eds. "Out-of-the-Box Leadership: Transforming the 21st Century Army and Other Top-Performing Organizations." *Monographs in Leadership and Management, Vol. 1*. JAI, 2007.

Kemp, Christopher R. "Trust – The Key to Leadership in Network Centric Environments." Unpublished Research Paper, U.S. Army War College, Carlisle, PA: 2003.

Moilanen, Jon H., and Donald M. Craig. "Leader Development in a Transforming Army." *Military Review*. Fort Leavenworth, KS: May/June 2000. Vol. 80, Iss. 3, 12-17.

Natter, John T., Alan Lopez, and Doyle K. Hodges. "Listen to the JO's: Why Retention is a Problem." *U.S. Naval Institute Proceedings*. Annapolis: Oct 1998. Vol. 124, Iss. 10, 58-62. http://proquest.umi.com (accessed 24 March 2009).

Nicholson, Major Demetrios J. (U.S. Army). "Seeing the Other Side of the Hill: The Art of Battle Command, Decision-making, Uncertainty, and the Information Superiority Complex." *Military Review*. Fort Leavenworth, KS: November/December 2005, 57-64.

North Central Regional Educational Laboratory. "Cognitive Skills." Learning Point Associates. http://www.ncrel.org/sdrs/areas/issues/content/cntareas/reading/li1lk23.htm (accessed 05 April 2009).

Office of Force Transformation. Department of Defense. *The Implementation of Network Centric Warfare.* January 5, 2005.

http://www.au.af.mil/au/awc/awcgate/transformation/oft_implementation_ncw.pdf (accessesd 30 March 2009).

Potts, David, ed. *The Big Issue: Command and Combat in the Information Age.* CCRP, 2003. Number 45.

Pritchard, LtCol Kenneth H. (US Army Reserve). "Competency-Based Leadership for the 21st Century." *Military Reivew*. Fort Leavenworth, KS: May/June 1999. http://www.au.af.mil/au/awc/awcgate/milreview/pritchard.htm (accessed 27 March 2009).

Russell, Emily (Army Staff Sgt). "JTF Guantanamo Troops Attend Leadership Course." *US Fed News Service, Including US State News*. Washington, DC: HT Media, 23 November 2008. http://proquest.umi.com (accessed 24 March 2009).

Scarborough, CDR Sheila (USN). "Network-Centric Warfare Meets the Laws of the Navy." *U.S. Naval Institute Proceedings*. Annapolis: May 2001. http://sheilascarborough.com/_wsn/page7.html (accessed 27 March 2009).

Smith, Edward A. *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War.* CCRP, 2002.

Springett, John P. II. "Network Centric War Without Art." *U.S. Naval Institute Proceedings*. Annapolis: Feb 2004. Vol. 130, Iss. 2, 58-61. http://proquest.umi.com (accessed 24 March 2009).

Stephens, Jon R. "Technology and Intervention: The Negative Impact on Future Leader Development." Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1999.

U.S. Army. *Army Leadership: Competent, Confident, and Agile*. Field Manual (FM) 6-22 (22-100). Washington, DC: Headquarters Department of the Army, 12 October 2006).

U.S. Army. *Operations*. Field Manual (FM) 3-0. Washington, DC: Headquarters Department of the Army, 27 February 2008.

U.S. Navy. *Maritime Operations at the Operational Level of War*. Navy Warfare Publication (NWP) 3-32. Washington, DC: Department of the Navy, Office of the Chief of Naval Operations, 18 October 2008.

U.S. Office of the Chairman of the Joint Chiefs of Staff. *Doctrine for Joint Operations*. Joint Publication (JP) 5-0. Washington, DC: CJCS, 26 December 2006.

Van Creveld, Martin. *Command In War*. Cambridge, MA: Harvard University Press, 1985.

Vego, Milan N. “Future War At Sea: Decline of Human Decision-Making in Naval Operations.” *Naval Forces*. January 2009, 8-15.

Vego, Milan N. *Joint Operational Warfare: Theory and Practice*. Newport, RI: U.S. Naval War College, 2007.

Wagner, Jill L. “The Effects of Network-Centric Warfare on Leadership: Fresh Perspectives for the Operational Leader.” Unpublished Research Paper, U.S. Naval War College, Newport, RI: 2007.

Willard, Admiral Robert F. (USN). “The Art of Command and Control.” *U.S. Naval Institute Proceedings*. Annapolis: Oct 2002. http://www.military.com (accessed 07 April 2009).

Wong, Leonard. *Stifled Innovation? Developing Tomorrow’s Leaders Today*. Carlisle, PA: U.S. Army War College Strategic Studies Institute, 2002.